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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/685,838	10/10/2000	Bruce Wayne Moore	RSW9-2000-0053	4600

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EXAMINER	
GRAHAM, CLEMENT B	
ART UNIT	**PAPER NUMBER**
3628	

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/685,838	MOORE ET AL.
	Examiner	Art Unit
	Clement B Graham	3628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 October 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action: (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in Graham v. John Deere Co., 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or unobviousness.

3. Claims 1-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graefe et al(Hereinafter Graefe U.S. Patent No. 5, 822, 747 in view of view of Hausman et al(Hereinafter Hausman U.S. Patent No. 6, 086, 619.

As per claims 1-2, 4-5 Graefe discloses a computer-implemented method for solving a current optimization problem, comprising the steps of:

Storing. (i. e, database") a plurality of data groups each associated with one of a plurality of anticipated optimization problems.(Note abstract and see column 1 line 65 and column 4 lines 5-65 and 5 lines 5-20) and (see column 40 line 45).

Graefe fails to explicitly teach each of the data groups including optimal solutions to corresponding anticipated optimization problem and solving the current optimization problem using the stored data groups.

However Hausman discloses the method of the invention, as embodied in Netcore and in alternate embodiments, includes an automatic transformation of the problem model from the enhanced graph theoretic form to a purely algebraic (or other well known

equivalent) representation which can be solved by commercial network, linear, integer, mixed integer linear, quadratic and other constraint programming packages. The commercial package solution is then automatically transformed back into the enhanced graph theoretic form. Since all the problem variables are elements of the problem graph, the solution graph is a subgraph of the original problem graph and may be visually indicated on a diagram of the original problem graph.

The power of the method is in implementing an abstract environment in which the behavior of Netcore elements, simple aggregations of these elements, relationships between them, and their corresponding values and constraints can be used to express and manipulate models of arbitrarily complex real world processes at and operational level of detail.(Note abstract and see column 4-8 lines 5-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Graefe to include optimal solutions to the associated anticipated optimization problem; and an optimization unit for solving the current optimization problem using the stored data groups taught by Hausman in order to solve problems that may be characterized as including network programs, linear programs, integer programs and mixed integer linear programs, all of which may have optional quadratic or bilinear terms in the objective functions.

As per claim 15, Graefe discloses, wherein each of the plurality of data groups further includes input values and intermediate calculation values pertaining to the associated anticipated optimization problem.(see column 3 line 65 and column 4 lines 5-35).

As per claim 17, Graefe discloses, wherein, in the preparing step. the plurality of look-up tables contain equation names, RHS (Right Hand Side) values, and objective values pertaining to the plurality of anticipated optimization problems.(see column 4 lines 10).

As per claim 18. Graefe discloses, wherein the optimization unit selects at least one of the plurality of data groups from the storage unit using the look-up tables, and determines whether or not the selected data group contains optimal solutions to the current problem.(see column 3 line 65 and column 4 lines 5-35).

As per claim 19, Graefe discloses The system of claim 18, wherein the optimization unit employs user-defined functions to select the at least one of the plurality of data groups from the storage unit.(see column 8 lines 30-40).

As per claim 20, Graefe discloses, wherein, if the optimization unit determines that the selected data group contains optimal solutions to the current problem, then the optimization unit outputs the optimal solutions included in the selected data group as optimal solutions to the current problem. (Note abstract and see column 1 line 65 and column 4 lines 5-65 and 5 lines 5-20).

As per claim 21, Graefe discloses, wherein, if the optimization unit determines that the selected data group does not contain optimal solutions to the current problem, then the optimization unit modifies the selected data group using a search method and iteratively solves the current problem using the modified data group to obtain optimal solutions to the current problem. . (Note abstract and see column 1 line 65 and column 4 lines 5-65 and 5 lines 5-20).

As per claim 22, Graefe and Hausman fails to teach, wherein the current problem is a financial portfolio optimization problem.

However solving a financial portfolio optimization problem is old and well known in the art because a portfolio represents data to be optimized and the teachings of Graefe and Hausman would have been able to perform such a step.

As per claim 23. Graefe fails to teach, wherein, the current problem is an optimization problem requiring the use of quadratic linear or integer optimization algorithms.

However Hausman discloses solving step, the current problem is an optimization problem requiring the use of quadratic linear or integer optimization algorithms.(see column 4 lines 25-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Graefe to the step of solving, the current problem is an optimization problem requiring the use of quadratic linear or integer optimization algorithms taught by Hausman in order to solve problems that may be characterized as including network programs, linear programs, integer programs and mixed integer linear programs, all of which may have optional quadratic or bilinear terms in the objective functions.

As per claim 24-25, Graefe discloses a Computer readable code stored on media, for solving an optimization problem, comprising:

a subprocesses for storing unit for storing (i. e, database") a plurality of data groups, each of the data groups associated with one of a plurality of anticipated optimization

problems.(Note abstract and see column 1 line 65 and column 4 lines 5-65 and 5 lines 5-20) and (see column 40 line 45).

Graefe fails to teach including optimal solutions to the associated anticipated optimization problem; and second subprocesses for solving the current optimization problem using the plurality of data groups.

However Hausman discloses the method of the invention, as embodied in Netcore and in alternate embodiments, includes an automatic transformation of the problem model from the enhanced graph theoretic form to a purely algebraic (or other well known equivalent) representation which can be solved by commercial network, linear, integer, mixed integer linear, quadratic and other constraint programming packages. The commercial package solution is then automatically transformed back into the enhanced graph theoretic form. Since all the problem variables are elements of the problem graph, the solution graph is a subgraph of the original problem graph and may be visually indicated on a diagram of the original problem graph.

The power of the method is in implementing an abstract environment in which the behavior of Netcore elements, simple aggregations of these elements, relationships between them, and their corresponding values and constraints can be used to express and manipulate models of arbitrarily complex real world processes at and operational level of detail.(Note abstract and see column 4-8 lines 5-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Graefe to include optimal solutions to the associated anticipated optimization problem; and second subprocesses for solving the

current optimization problem using the plurality of data groups taught by Hausman in order to solve problems that may be characterized as including network programs, linear programs, integer programs and mixed integer linear programs, all of which may have optional quadratic or bilinear terms in the objective functions.

As per claim 26, Graefe discloses, wherein each of the plurality of data groups further includes input values and intermediate calculation values associated with the corresponding anticipated optimization problem.(see column 4 lines 10).

As per claim 27, Graefe discloses the code of claim 24, further comprising: fifth subprocesses for preparing a plurality of look-up tables for identifying each of the plurality of data groups, wherein the plurality of look-up tables contain equation names, RHS (Right Hand Side) values, and objective values pertaining to the plurality of anticipated optimization problems.(see column 3 line 65 and column 4 lines 5-35).

As per claim 28, Graefe discloses, wherein the second subprocesses select at least one of the plurality of data groups using the look-up tables, and determine whether or not the selected data group contains optimal solutions to the current problem. .(see column 3 line 65 and column 4 lines 5-35).

As per claim 29, Graefe discloses, wherein the second subprocesses select the at least one of the plurality of data groups using user-defined functions.(see column 8 lines 25-40).

As per claim 30, Graefe, discloses wherein, if it is determined that the selected data group contains optimal solutions to the current problem, then the second subprocesses output the optimal solutions included in the selected data group as

optimal solutions to the current problem. (Note abstract and see column 1 line 65 and column 4 lines 5-65 and 5 lines 5-20).

As per claim 31, Graefe discloses, wherein, if it is determined that the selected data group does not contain optimal solutions to the current problem, then the second subprocesses modify the selected data group using a search method and iteratively solve the current problem using the modified data group to obtain optimal solutions to the current problem(Note abstract and see column 1 line 65 and column 4 lines 5-65 and 5 lines 5-20).

As per claim 32. Graefe and Hausman fails to teach, wherein the current problem is a financial portfolio optimization problem.

However the solving a financial portfolio optimization problem is old and well known in the art because a portfolio represents data to be optimized and the teachings of Graefe and Hausman would have been able to perform such a step.

As per claim 33. Graefe fails to teach, wherein, the current problem is an optimization problem requiring the use of quadratic linear or integer optimization algorithms.

However Hausman discloses solving step, the current problem is an optimization problem requiring the use of quadratic linear or integer optimization algorithms.(see column 4 lines25-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Graefe to the step of solving, the current problem is an optimization problem requiring the use of quadratic linear or integer

optimization algorithms taught by Hausman in order to solve problems that may be characterized as including network programs, linear programs, integer programs and mixed integer linear programs, all of which may have optional quadratic or bilinear terms in the objective functions.

Conclusion

4. The prior art of record and not relied upon is considered pertinent to Applicants disclosure.

Pang et al (US Patent 6,546, 375) teaches apparatus and method of pricing financial derivatives.

Nordin et al (US 6, 128, 607 Patent) teaches computer implemented machine learning method and system.

Krongold et al (US 6, 400, 773 Patent) teaches section division operation method for multi carrier communication system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Clement B Graham whose telephone number is 703-305-1874. The examiner can normally be reached on 7am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung S. Sough can be reached on 703-308-0505. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-0040 for regular communications and 703-305-0040 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

CG

February 03, 2004

HYUNG SOUGH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600